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Alvania cimex (L.) s.l. (Gastropoda, Prosobranchia), an aggregate species

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INTRODUCTION

Alvania cimex (Linnaeus, 1758) s.l. is generally considered a well known species, with shells belonging to it numerously washed ashore along the entire Mediterranean. As such, it has been pictured well in the literature, e.g., by Bucquoy et al. (1884: pl. 33 figs. 10-17) and by Ponder (1985: figs. 86a-e). For some time it has been known that two types of apex do occur among *A. cimex* s.l. (Verduin, 1977: 94). For this paper I measured the apices of all shells available from Spain, France and Jugoslavia, which are the only regions where, to my knowledge, the form with a relatively small apex does occur in reasonable quantities. I found only one shell with a small apex (Sfax, Tunisia, MNHN) among the numerous shells examined from other regions.

The results of the measurements are presented in fig. 1. Obviously, there are two clusters of shells which correspond with two types of apex, the larger one and the smaller one. Though the accuracy of the measurements is estimated to be only about 0.01 mm in well preserved apices, I do not think that the dimorphism which appears in fig. 1 is accidental. In the first place because it seems to be rather improbable that the more or less empty zone between the two clusters might be accidental. But also because of the striking resemblance with the results of the same type of measurements among *Rissoa membranacea* and *R. labiosa* (see Verduin, 1982: fig. 1), two very similar forms which almost certainly must be considered distinct species. The possibility that we are dealing with sexual dimorphism seems to be very small indeed, because in that case one would expect both types of apex to be present in the entire range of *A. cimex* s.l., which is not the case. Under these circumstances it seems best to consider the dimensions of the apex a specific character among *A. cimex* s.l., notwithstanding the fact that the species concerned cannot be distinguished in any other shell-morphological way (see also Verduin, 1986).

Alvania europea Risso, 1826, is the type species of the genus *Alvania* (see Ponder, 1985: 36). I have examined the syntypes of *A. europea* (lectotype plus three paralectotypes in MNHN) and found all apices damaged. Consequently, these shells cannot be identified with certainty: they either belong to *A. cimex* s.s. or to *A. mamillata* Risso, 1826. Because of the presence of types with undamaged apex, I have decided to give relative priority to *A. mamillata* over all its synonyms published by Risso in the same work (Art. 24a of the I.C.Z.N.).

This study is based on shells only. Material from the following collections was studied: Muséum National d'Histoire Naturelle, Paris (MNHN); Rijksmuseum van Geologie en Mineralogie, Leiden (RGM); Rijksmuseum van Natuurlijke Historie, Leiden (RMNH); the private collections of Dr. J.J. van Aartsen, Dieren (Aar), and of myself (Vrd).

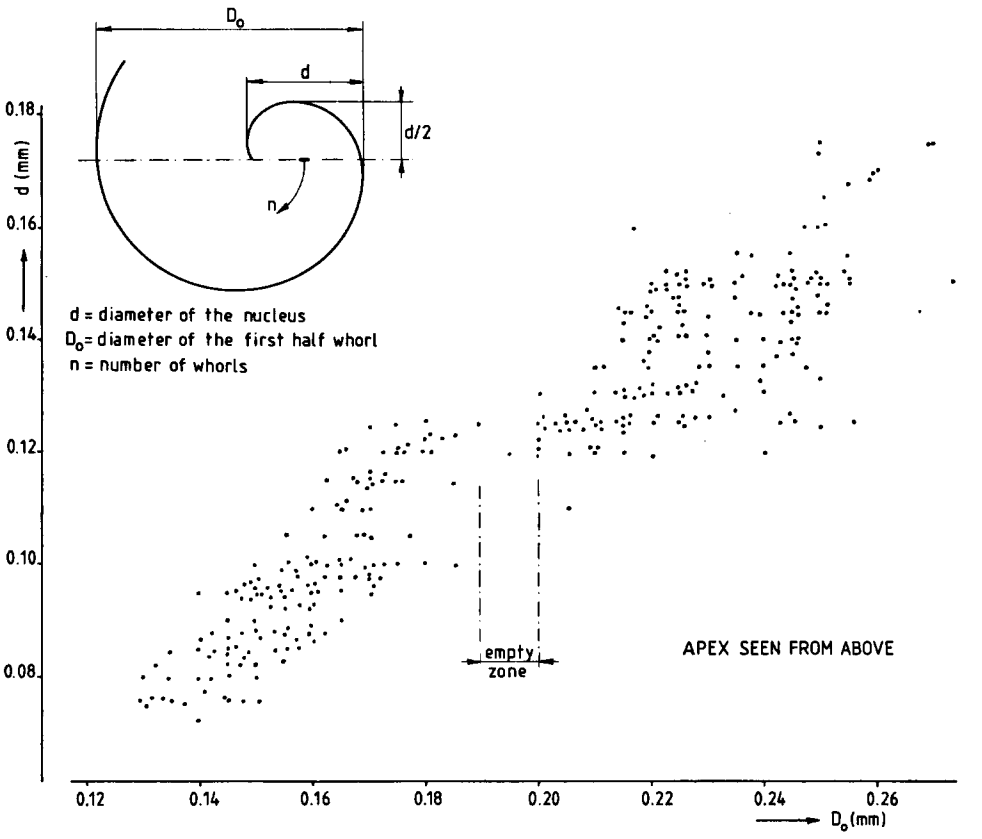

Fig. 1. Dimensions of the apices of *A. cimex* s.s. and *A. mamillata*. *A. cimex* from Spain: Benidorm (Vrd 0085/11), El Arenal (Aar 1003/6); France: Paulilles (Vrd 0086/2, 0154/2), Sausset les Pins (RMNH/3, Aar 11716/31), Rousillon (MNHN/1), Cannes (MNHN/1); Jugoslavia: Koromačno (RGM 224547/88), Biograd (Vrd 0160/1) *A. mamillata* from Spain: Benidorm (Vrd 0046/1, 0047/2), Es Pujol (Aar 4319/17), Playa es Cavalet (Aar 4691/1), Portinata (Aar 4537/4). Gerona (RMNH/1); France: Pyrenées Orientales (RMNH/2), Cabasson (Aar 11797/4), Sausset les Pins (Vrd 0031/2, Aar 11717/13, RMNH/6), La Capte (Aar 11598/2, Vrd 0230/8), Port Le Niel (Vrd 0066/7), Cassis (MNHN/1), St Raphaël (MNHN/24), La Ciotat (Vrd 0036/1, 0038/6), Cannes (MNHN/6, RMNH/1), Porto Pollo (Aar 13763/9), Corsica (MNHN/2); Italy: Gerona (RMNH/1), Sorrento (Aar 9793/4); Jugoslavia: Rovigne (RMNH/6); Koromačno (RGM 224547/9), Biograd (Vrd 0088/12), Split (RMNH/1), Srebreno (Vrd 0030/17). Specimen in "empty zone": Cannes (MNHN).

I am grateful to all those who made their material available for this investigation. To Dr. Ph. Bouchet, Paris, I am also obliged for information about the syntypes of Desmarest, to Prof. M. Franzini, Pisa, for information about types of Gualtieri, to Mrs. S. Morris, London, for information about *Turbo cimex* in the Linnean Society of London, and to Dr. van Aartsen for drawing my attention to the different apices among his material from Algeria.

SYSTEMATIC PART

Alvania cimex (Linnaeus, 1758) (fig. 2)

Turbo cimex Linnaeus, 1758: 761, no. 530 (in M. Mediterraneo).

Types. — Neotype, design. nov.; RMNH 55870 ex RGM 224547a, Koromačno near Labin, Jugoslavia, Hrvatska, Istria, shore of Raški Zaljev, dead in sample of shell grit from clay, depth about 4 m. Length 5.4 mm, 7.1 whorls counted as shown in fig. 1. Protoconch with about 2.2 whorls. Dimensions of the apex about d = 0.08 mm and D_0 = 0.14 mm. There are 87 other shells, fragments and juveniles with undamaged apex in the sample (RGM 224547b).

Description. — Shells of *A. cimex* s.s. can only be distinguished from those of *A. mamillata* (figs. 3-4) by the dimensions of the apex ($d \leq 0.13$ mm, $D_0 \leq 0.19$ mm) and by the number of whorls of the protoconch, i.e. 2.0-2.3.

Distribution. — Only known from the Mediterranean coasts of Spain and France, and from Jugoslavia. I also found one shell of this species among a large sample of *A. mamillata* in MNHN, labelled "Rissoa cimex L./Sfax/Voyage de M.P. Pallary en Tunisie (Août-Septembre 1904)".

Discussion. — The collection of Linnaeus was investigated by Hanley, who wrote (1885: 327) "Our author having indicated his possession of the *Turbo cimex*, search was made in his cabinet, for the shell generally regarded by Montagu and the English conchologists as the veritable species of Linnaeus. This was not to be discovered, but a large parcel of the *Rissoa calathiscus*[1] (Philippi, Moll. Sicil. vol. ii. p. 125; *R. granulata*[1], vol. i. p. 153) was found enveloped in a leaf torn from some Swedish book, and as these shells perfectly answer to the description, and none other in the collection correspond with the definitions, no reasonable doubt can be entertained of their typical authority." Dodge (1959: 222), however, is of the opinion that these shells might be accepted as Linnaeus' syntypic lot only on a "probable" basis. From all this I infer that the shells may have never been identified as *Turbo cimex* by Linnaeus himself. I cannot accept them as syntypes. A lecto- or neotype from among them seems never to have been designated.

The species is not mentioned in Linnaeus' (1764) catalogue of the collection of Queen Louise Ulrike or in Holms's (1957) lists. Thus, the only reliable syntype might be the shell depicted by Gualtieri (1742: pl. 44 fig. X), to which Linnaeus did also refer in his diagnosis. Prof. M. Franzini, however, wrote to me that this shell is missing in the Museo di Storia Naturale at Pisa, which contains the Gualtieri collection. I do consider Gualtieri's figure itself of insufficient quality to be used as an illustration of the lectotype.

Under these circumstances, I would have preferred to designate a neotype of *T. cimex* from among the "large parcel of the *Rissoa calathiscus*" which Hanley had come across in the Linnaeus collection, but the Linnean Society, which holds the sample, does not permit the loan of it. Because I had no intention to travel to London, nor to delegate in this subtle case the selection of a neotype to somebody else, I have finally decided to designate a neotype of *Turbo cimex* from among material I had access to. It has been selected conspecific with the shell whose apex was depicted by Ponder (1985: fig. 86b-c), an apex which obviously is of the smaller type, judging after Ponder's

[1] Synonyms of *Turbo cimex*.

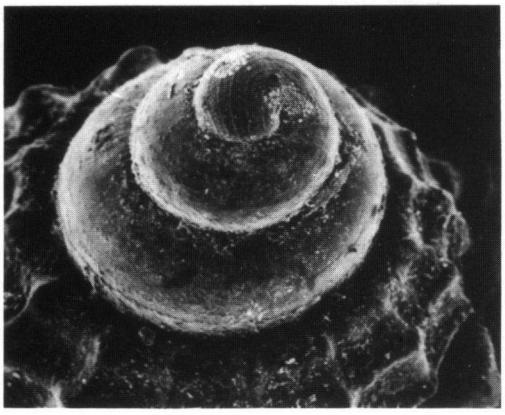

Fig. 2

Fig. 3

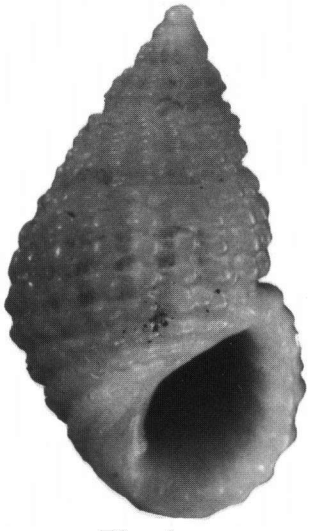

Fig. 4

Figs. 2-4. *Alvania* species. 2. *Alvania cimex* s.s., Koromačno (RGM 224547), apex 110 ×. 3-4. *Alvania mamillata*. 3. Sfax (Aar 9601), apex, 110 ×. 4. Srebreno (Vrd 0030), 15 ×.

figure. Because Linneaus mentioned as type locality "M. Mediterraneo", I felt justified to designate the neotype from the finest sample available, which happened to be from the Adriatic Sea.

Alvania mamillata Risso, 1826 (figs. 3-5)

Alvania mamillata Risso, 1826: 145, no. 363, fig. 128 (S. Europe, in particular the area around Nice and the Alpes Maritimes).

Types. — Lectotype plus paralectotype in MNHN. No precise locality mentioned.

Description. — *A. mamillata* has the larger type of apex (d ≥ 0.12 mm, D_o ≥ 0.20

mm) with a paucispiral protoconch (about 1.3 whorl). The protoconch is not shouldered. The shells are very variable as regards length (1.9 to over 5.5 mm), and as regards solidity and sculpture. Small shells may be remarkably fragile, with poorly developed labial rib and sculpture (e.g. a sample from Paphos, Cyprus, Vrd 0018).

Distribution. — The entire Mediterranean.

Discussion. — It was difficult to establish the proper name of this species. *A. cimex* s.l. has, for instance, been mentioned in connection with *Turbo cancellatus* E.M. da Costa (1778: 104), *Turbo calathiscus* Montagu (1808: 132), *Rissoa cancellata* Desmarest (1814: 8), and *Turbo cancellatus* Lamarck (1822: 49). Because Da Costa recorded his species also from Guernsey and Cornwall, where *A. cimex* s.l. does not occur, I fully agree with Dodge (1959: 220), who wrote "I cannot find sufficient information in either his description or his figure to permit the use of the name *cancellatus* as a synonym of *cimex*." Montagu reports his species from British localities only, where *A. cimex* s.l. does not occur, and, moreover, considers it a distinct species (1803: 315). Therefore, I cannot agree with Dodge, who was inclined to consider *T. calathiscus* a synonym of *T. cimex* s.l. Also, *T. calathiscus* is absent in Dean's (1936: 229) list of type material from Montagu in the Exeter Museum, which probably means that the syntypes have been lost.

Dr. P. Bouchet wrote to me that Desmarest's syntypes must be considered lost. Therefore, I consider *R. cancellata* Desmarest a nomen dubium, though it undoubtedly is conspecific with *A. cimex* s.l. Moreover, the name is probably preoccupied by *T. cancellatus* Da Costa, 1778, which almost certainly is an *Alvania*. The name *T. cancellatus* Lamarck, 1822, is preoccupied by Da Costa's species, unless both prove to be conspecific. Because of these considerations, I have decided to use one of the names introduced by Risso in 1826. I have examined all lectotypes and paralectotypes of *A. europea, A. freminvillea* Risso, 1826, and *A. mamillata*, and found all apices damaged, except those of the two shells of *A. mamillata*, which both have the larger type of apex without shoulder. As already mentioned in the introduction, I have therefore given the name *mamillata* relative priority.

It had struck me that, among a large sample from the harbour of Ródhos town, Greece (Vrd 0069), the length of the shells is restricted to 4.2 mm. As a consequence I examined all other material available from the eastern Mediterranean, and found that larger shells seem to be very rare indeed in that area. This suggested that smaller shells might possibly be more than a simple variety. In order to investigate this possibility, I measured the shells in a number of suitably chosen samples (fig. 5), and examined a number of other samples. The conclusion is, that I could find no support whatsoever for the possibility that smaller shells might belong to a distinct species. Obviously, however, the length is subject to considerable geographical variation.

Alvania aartseni spec. nov. (fig. 6)

Types. — Holotype in RMNH, no. 55849 (ex Aar 10993), Algeria, El Djemila (= La Madrague). Length 3.6 mm, 5.3 whorls, protoconch 1.3 whorl, counted as shown in fig. 1. The dimensions of the apex are about d = 0.12 mm and D_o = 0.21 mm. Paratypes: RMNH 55850 (3 juvenile shells, ex Aar 10993); Aar 10993 (1 full grown shell plus 24 juvenile ones); Aar 10746 (8 shells); Aar 11052 (2): RMNH (4 shells labelled "Rissoa (Alvania) cimex L. var. depauperata Monts./Algeria").

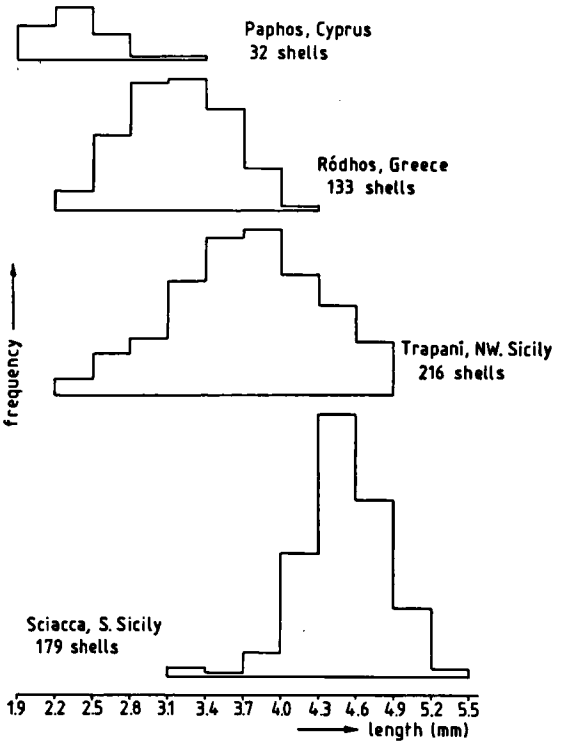

Fig. 5. Length of *Alvania mamillata* from different localities, Paphos (Vrd 0018), Ródhos (Vrd 0069), Trapani (Vrd 0103), Sciacca (Vrd 0005).

Description. — *A. aartseni* has the larger type of apex. It mainly differs from *A. mamillata* in the shouldered protoconch. I did see no specimens which measure over 3.8 mm. The colour is light yellow or dirty white, often with weak yellowish colour bands.

Distribution. — As yet only known from Algeria, viz. El Djemila, about 10 km W. of Alger (type locality), and from Sidi Ferruch, about 20 km W. of Alger (paratypes).

Discussion. — I consider *A. aartseni* specifically distinct from *A. mamillata* because of the differences of their apices, and because of their sympatric occurrence, teste samples of *A. mamillata* from Sidi Ferruch (Aar 11083, 5 shells) and El Djemila (Aar 10539, 22), which were collected together with the types of *A. aartseni*. In particular, the samples from El Djemila contain numerous juvenile shells with the apex in excellent condition, which demonstrate beyond doubt that two types of protoconch are involved, shouldered ones and those which are not shouldered. Because of the complete absence of intermediate forms, and because of the rarity of morphological dimorphism among marine molluscs other than sexual dimorphism, it seems to be very improbable that the two types of protoconch should be considered varieties of only one species.

I have contemplated the possibility to use the name *depauperata* Monterosato, 1877, for this species, which might have been possible by the proper choice of a lectotype

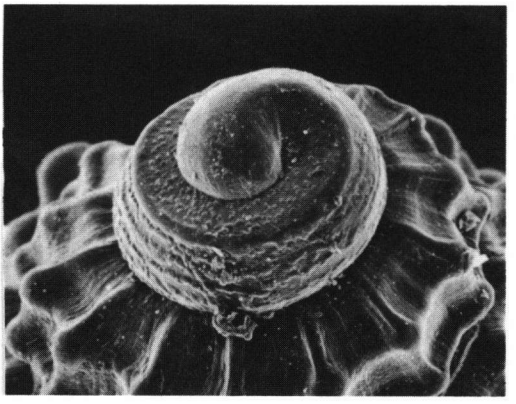

Fig. 6. *Alvania aartseni*, El Djemila (Aar 10993), apex of paratype, 110 x .

from among the syntypes of *A. cimex* var. *depauperata*. But in the first place, I had no access to such syntypes. Furthermore, the original diagnosis (1877: 34) says "sur tous les points de la Mediterranée" and "la forme typique, à Alger, est fortement colorée", observations which in my experience apply to *A. mamillata* rather than to *A. aartseni*.

SUMMARY

Three distinct species are distinguished among *A. cimex* (L.) s.l., i.e. *A. cimex* s.s., *A. mamillata* Risso, and *A. aartseni* spec. nov. They differ in the form and the dimensions of the apex. A neotype of *A. cimex* is designated.

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SAMENVATTING

Alvania cimex, een complex van drie soorten

Op basis van afmetingen en vorm van de topwinding wordt *Alvania cimex* s.l. opgesplitst in drie soorten. Van deze is *A. aartseni* nog maar alleen bekend van Algerije. *A. mamillata* spoelt algemeen aan in de gehele Middellandse Zee. *A. cimex*, de enige vorm met kleine topwinding, is bekend van O. Spanje, Z. Frankrijk en de Adriatische Zee. Er is bovendien één exemplaar bekend van Tunesië. Om verwarring te voorkomen is een neotype van *A. cimex* s.s. aangewezen.